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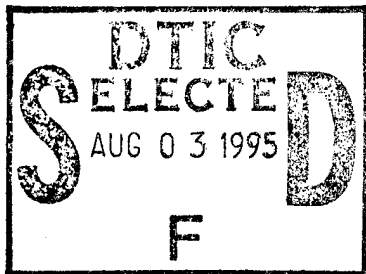
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NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

**AN EXAMINATION OF THE ENVIRONMENT AND
PROCESS RELATIVE TO REQUIREMENTS GENERATION
FOR MARINE CORPS WEAPON SYSTEMS**

by

Tom L. Tyrrell

December 1994

Principal Advisor:

Rebecca J. Adams

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REPORT DOCUMENTATION PAGEForm Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)**2. REPORT DATE**

December 1994

3. REPORT TYPE AND DATES COVERED

Master's Thesis

4. TITLE AND SUBTITLE**AN EXAMINATION OF THE ENVIRONMENT AND
PROCESS RELATIVE TO REQUIREMENTS GENERATION
FOR MARINE CORPS WEAPON SYSTEMS****5. FUNDING NUMBERS****6. AUTHOR(S)**

Tyrrell, Tom L.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)Naval Postgraduate School
Monterey, CA 93943-5000**8. PERFORMING ORGANIZATION
REPORT NUMBER****9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)****10. SPONSORING/MONITORING
AGENCY REPORT NUMBER****11. SUPPLEMENTARY NOTES**

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE**13. ABSTRACT (Maximum 200 words)**

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The major conclusion drawn is that greater incorporation of operational Commander's inputs will serve to develop a more viable baseline required operational capability, and that the best vehicle to record and manage these inputs may be the Remedial Action Program (RAP).

14. SUBJECT TERMSMarine Corps Weapon Systems, Requirements Generation, Marine Corps
Acquisition Process, Remedial Action Program (RAP)**15. NUMBER OF PAGES**

61

16. PRICE CODE**17. SECURITY CLASSIFICATION
OF REPORT**
Unclassified**18. SECURITY CLASSIFICATION
OF THIS PAGE**
Unclassified**19. SECURITY CLASSIFICATION
OF ABSTRACT**
Unclassified**20. LIMITATION OF ABSTRACT**
UL

Approved for public release; distribution is unlimited.

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FOR MARINE CORPS WEAPON SYSTEMS**

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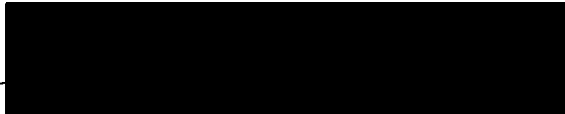
Submitted in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

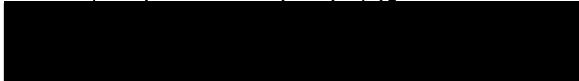
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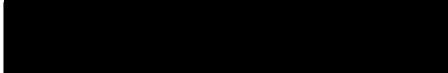
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ABSTRACT

This thesis examines the acquisition environment and the Marine Corps Acquisition Process as they relate to the determination of initial requirements for weapon systems in juxtaposition with Congressional and public expectations.

The major conclusion drawn is that greater incorporation of operational Commander's inputs will serve to develop a more viable baseline required operational capability, and that the best vehicle to record and manage these inputs may be the Remedial Action Program (RAP).

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I. INTRODUCTION

A. GENERAL INFORMATION

As the active component of the U.S. military executes the most significant peace-time reduction in personnel since the Korean War, every aspect of the acquisition process will continue to be placed under the Congressional and Public microscope with a mandate to demonstrate its competency.

The exact numbers are uncertain, but a reduction of at least 25 percent in DoD structure, during the period 1990 through 1996, has been consistently mentioned by both the former Secretary of Defense, The Honorable Mr. Cheney and the former Chairman of the Joint Chiefs of Staff, General Powell. [Ref. 22:p. 19] The active duty end strength for fiscal year (FY) 1991 was 91,400 fewer than in FY 1989 or approximately equivalent to 1980 levels. [Ref. 22:p. 22] Concomitantly, there is a programmed reduction in defense funding. Beginning in FY 1986, resources appropriated for defense have steadily declined.

By fiscal year (FY) 1995, the result will be a cumulative 10-year real decline of 22 percent, and Department of Defense (DOD) outlays as a percentage of our Gross National Product (GNP) and of total federal outlays will be the lowest in 50 years. ... when the projections through FY 1995 are included, our actual budgets will end up \$515 billion below what the zero-real-growth level would have been for the period FY 1986-95. [Ref. 22:p. 16]

B. OBJECTIVE OF THE RESEARCH

The purpose of this study is twofold: first, to examine the current Congressional / Public acquisition environment as it relates to requirements determination and second, to provide a detailed overview of the Marine Corps acquisition process to conceptually assess where the process might be improved to effectively match up with Congressional expectations. The study was proposed and sponsored by, LtCol E.J. Lesnowicz, Head of the Lessons Learned Section, Studies and Analysis Branch, Marine Air-Ground Task Force Warfighting Center, U.S. Marine Corps Combat Development Center, Quantico, Virginia. The study is intended to be utilized as background information for LtCol Lesnowicz's development of a plan which broadens and reinforces the application of Remedial Action Program information in deriving equipment based/user generated solutions to combat deficiencies. The Remedial Action Program (RAP) is intended to be, "a process through which deficiencies or shortfalls are identified and actions are directed to track resolution of the problem." [Ref. 7:p. 1 (Enclosure 2)] In essence, the RAP is the conduit through which combat equipment shortfalls, identified in the Marine Corps Lessons Learned System (MCLLS), are introduced into the acquisition process. MCLLS is the Marine Corps program for collation and dissemination of information submitted via exercise after action reports (AAR). [Ref. 7:p. 1]

As the resources available to equip our military force decline, each weapon systems requirement, quantity, quality, and attendant performance thresholds, must possess the resilience to endure a potentially internecine competition for funding. To achieve the objective of the research, the following research question is posed: In concept, how well does the Marine Corps acquisition process match Congressional expectations regarding the necessity, efficiency and effectiveness of weapon systems placed into the DoD procurement process?

To answer the basic research question, the following subsidiary questions are asked:

1. What is the present environment as it relates to Congressional expectations / demands for information when a military service places a weapon system into the procurement process?
2. In overview, what is the present Marine Corps Acquisition process and how does the process incorporate newly identified weapon systems requirements?
3. Would the Marine Corps acquisition process better match Congressional expectations by formally recording "user" generated weapon systems performance requirements via the Remedial Action Program.

C. SCOPE AND LIMITATIONS OF THE STUDY

This study includes an assessment of the need for expanding our current process for the initiation of weapon systems programs and, apriori, the generation of performance requirements for those systems. To this end, the study uses both current literary and historical examples of the potential

for improvement in the requirements generation process. The study includes a summary and analysis of the current DoD acquisition environment, and the U.S. Marine Corps mechanism for weapon systems program initiation. This study does not make specific recommendations as to current weapons system programs, but does attempt to illustrate the potential benefit accrued from well crafted weapon systems requirements.

D. METHODOLOGY

The research information is collected by means of a literature review, and several personal interviews augmented with subsequent telephonic interviews. There is a substantial amount of literature available on the broad subject of acquisition reform, but little devoted to the determination of mission need, early in the process, prior to entry into the formal acquisition process at milestone 0 (concept studies approval). Milestone 0 is the first formal interface between the service's identification of a requirement for a new weapon system and the DoD acquisition management system which will ultimately procure the hardware. [Ref. 28:Part 2] Literature reviews consist of books, professional journals, current and draft regulations and directives, General Accounting Office reports, and the records of testimony before both the House and Senate Committees on the Armed Services during multiple Congressional sessions. This literature was accumulated from the Naval Postgraduate School Library, the Defense Logistics

Studies Information Exchange (DLSIE), several DoD offices located at the Pentagon in Washington, D.C. and the U.S. Marine Corps Combat Development Center (MCCDC) in Quantico, Virginia. Both personal and telephonic interviews were conducted with representatives of the Marine Corps Research and Development Command and the Marine Corps Combat Development Center. Personal interviews were conducted with representatives from each Military Headquarters and the representatives of the Joint Staff. The underlying premise for these interviews is that those responsible for day-to-day integration of requirements into the acquisition process are most familiar with each system's contents and capabilities. Through literature research an attempt is made to understand the current environment surrounding DoD acquisition and to determine if the product of remedial action programs can be incorporated into the resolution of equipment related combat deficiencies. Furthermore, can remedial action program information be synthesized with the genesis of mission need statements to create more durable / defensible operational performance requirements.

E. ORGANIZATION OF THE STUDY

Chapter II provides background information and a recent historical perspective of the current and future DoD acquisition environment. Chapter II also examines the acquisition environment relative to its interface with Congress and

summarizes how those expectations will be manifested to the services when attempting to gain funding for weapon systems.

Chapter III examines the Marine Corps Acquisition process with emphasis on weapon systems program initiation. This chapter also provides a summary of how RAP information might be fitted into the Marine Corps acquisition process when the need exists for a historical record to match weapon systems performance thresholds with the original user identified combat deficiency.

Chapter IV provides conclusions and recommendations for future research.

II. THE ACQUISITION ENVIRONMENT

The purpose of this chapter is to provide a perspective on the current and future acquisition environment within the Department of Defense (DoD). To capture the current posture and attitudes, two points of departure are utilized: first, an overview of public opinion, and second, a look at interaction between the DoD and Congressional oversight committees. In summary, regulatory reforms are overlaid in a brief review of recent changes within the DoD's approach to acquisition as the Department responds to Congressional demands.

Due to the huge Federal debt service on interest accrued to the deficit, a flat rate of growth in Gross National Product, and the political reluctance to reduce domestic spending and transfer payments, the Department of Defense remains the nucleus of Congressional funding reduction efforts. By law, the Congress simply does not have flexibility in determining spending rates for interest payments or entitlement programs, because they are fixed amounts, as are their required annual increases. This fact coupled with sluggish revenue generation by a relatively flat GNP growth rate means that Congress will continually be driven to "National Defense" as the only available reduction opportunity to attack the "deficit." Although the budget certainly will

never be balanced on the back of "National Defense," the DoD will remain a viable political target. [Ref. 18:pp. 79-87]

A. PUBLIC OPINION

For those involved in the study of the acquisition business there is no surprise in discovering a widely held negative public opinion of the people and for the process related to weapons acquisition. This unflattering viewpoint is discussed, to some degree, in every literary reference viewed while conducting research for this study. [Ref. 6:pp. 123-150 and Ref. 23:preface]

Two representative examples are related herein; their implicit messages are clear. Mr. W. H. Gregory in his book, The Defense Procurement Mess states very flatly:

How the American military buys its equipment is the subject of public derision. In the minds of much of the citizenry, the Pentagon procurement system is scandalous and the defense industry is manned by fast buck artists, incompetents or deranged Dr. Strangeloves who, when they lack weapons of mass destruction to tinker with, design \$600 hammers or \$5,000 coffeepots. The perception of the average taxpayer is that his military hardware money is being tossed around by profligate generals or admirals seduced by greedy, unconscionable contractors; instead of more bang for the buck, military procurement goes for either shoddy equipment or high-tech extravagances that don't work in the field. [Ref. 19:p. 1]

On 15 July 1985, President Reagan established a Blue Ribbon Commission on Defense Management with a broad charter to study Defense policies and procedures. The Commission was to focus on adequacy and efficiency. Upon completion of their

study, recommendations were forwarded to the President, the Secretary of Defense and Congress.

Pursuant to this process, the Commission conducted research to ascertain public opinions about the efficacy of Defense procurement. [Ref. 25:pp. 190-246] When Americans were asked to rank order Defense spending as a problem relative to other issues facing the Government, Defense budget inefficiency was considered a major issue second in seriousness only to the budget deficit. "On average Americans believe that almost half the U. S. defense budget is lost to waste and fraud." [Ref. 25:pp. 190-192] The loss was attributed to illegal activities (25 percent) and Defense mismanagement (25 percent). When queried as to who is at fault for poor management in the administration of Defense spending, most Americans believe that Congress is "less" to blame than defense contractors or the Defense Department. "Pork barrel projects," Congressional micromanagement, and yearly changes in defense authorizations are not judged to be wasteful. [Ref. 25:pp. 190-194]

Dr. Jacob Stockfish begins the preface to his book, Plowshares Into Swords, by relating how the public has been made increasingly aware of problems within the Defense Department, in the procurement of weapon systems which experienced significant cost overruns or failed to meet performance requirements. [Ref. 17:p. IX]

This low public esteem for the Defense procurement arena continues to be fortified on a regular basis by eager media coverage of the latest procurement scandal (cancellation of the A-12, a four billion dollar program is a recent case in point). The instances cited above reflect opinion from 1973 through 1990. This dour holding by the majority of Americans is an apparent fact of the times and one that depicts an aspect of the acquisition environment which all procurement officials should consider as they discharge their procurement tasks. [Ref. 18:p. 6]

B. MAJOR AGENCIES IN DOD PROCUREMENT

DoD procurement involves literally tens of thousands of personnel employed by contractors, the military and various Government agencies. Congress, and the Department of Defense, which together determine the expenditure of the approximately \$300 billion spent annually to equip and maintain our military forces. Further perspective of the acquisition environment will be developed through a brief discourse of the major participants' relative stations and their interaction.

1. Congress

Congress is empowered by the Constitution to raise and dispense funds. Accomplishment of this feat is a tedious and complex task performed on an annual basis. The Senate and House Armed Services Committees, Authorization Committees and Appropriation Committees, in conjunction with numerous

subcommittees, discharge these responsibilities. While Congressional oversight, in guardianship of the public trust, is an absolute imperative, a pervasive tendency for aggressive and contentious micromanagement is frequently noted. Several literary references viewed for this study contain at least one expositive comment regarding the unbalanced and inefficient manner in which Congress fulfills their oversight role. [Reference 19:pp. 49-65]

Insight as to the weight of these requirements was provided in Congressional testimony by the former Secretary of Defense, Mr. Dick Cheney, who solicited relief from the submission of redundant and unnecessary Congressional reports. He stated that, "Since 1970, the number of reports and studies has increased by over 2,300 percent. In FY 1989, the total cost of complying with Congressional reporting requirements was \$33 million and almost 509,000 man-hours." [Ref. 22:p. 35] The aggressive nature and specificity applied by Congress, in this role, is inferred by the intense questioning which took place before the Senate Armed Services Committee during sessions reviewing the FY 1991 Defense Budget.

On February 17, 1990, Senator Alan Dixon posed a rapid fire series of questions regarding weapon systems commonality to then Secretary of the Army, Mr. Stone. In sum, Senator Dixon related that the Marines had just completed a market survey to develop a light armored assault gun and the Army had recently initiated a market survey to replace the M551

Sheridan (light tank). The Senator felt strongly that these weapon systems would be meeting identical combat needs and that acquiring dissimilar weapon systems to perform like missions was inefficient. Senator Dixon closed his questioning of Mr. Stone with the following remark, "Earlier this year, I questioned this budget because of issues that just didn't make any sense. And Mr. Secretary, this just does not make sense!" [Ref. 22:p. 364] Secretary Stone then followed with a lengthy defense of not only this issue but several other Army procurement efforts.

On February 28, 1990, (before the same committee) Senator Dixon pursued the same issue, on the same weapon systems, with different witnesses in an attempt to find a fault in the logic the Army had developed to replace the M551 Sheridan. The witness was the former Army Chief of Staff, General Carl Vuono. Senator Dixon's pursuit of commonality, with this system as an example, continued with similar questions as to market studies and mission needs. Further, Senator Dixon added that he had been assured by the Marines that any system they developed would also meet Army performance requirements. He concluded by asking General Vuono,

Can you explain why any and all funding for both the Army and Marine Corps should not be held up in these tight budget times until the Army and Marine Corps can get together ... to meet the requirements of both services?
[Ref. 22:p. 585]

The above was not an atypical exchange. Similar colloquy is present throughout the testimonial records of both the House and Senate Committees on the Armed Services. [Refs. 22, 27, and 30] Deducible from these exchanges is not only the blunt tone but more importantly the necessity of unassailable logic and detailed knowledge in communicating a successful defense of DoD weapon systems requirements.

The President's Blue Ribbon Commission on Defense Management makes a matter-of-fact recommendation which addresses the issue. "Congress should reduce the overlap, duplication and redundancy among the many Congressional committees and subcommittees now reviewing the defense budget." [Ref. 25:p. 8]

2. The Department of Defense (DoD)

The DoD acquisition process has been the subject of much analysis since the modern day revision initiated by former Secretary of Defense, Mr. Robert McNamara, in the early 1960s. He brought to the office of the Secretary of Defense a "business" mentality and unsuccessfully attempted to institute "business" management practices into the schema of DoD procurement. Instead, increased layers of management and added paperwork created a burdensome micromanagement atmosphere which has persisted to the present. [Ref. 19:pp. 1-17] The resultant slowdown in decision-making had obvious results: "After all this tinkering, a system that once designed an aircraft, missile, ship, or tank and got it into

production in three to five years now takes ten to fifteen years to do the same thing." [Ref. 19:p. 5]

Examples of formal studies and commissions addressing at least one aspect of defense procurement include: The Bell Report- 1962, The Commission on Government Procurement- 1972, The President's Private Sector Survey on Cost Control (Grace Commission) - 1983, The President's Blue Ribbon Commission on Defense Procurement (Packard Commission)- 1986, and the Defense Management Report (DMR)- 1990-91. The DMR generated substantial change within the DoD. When combined with the significant reduction in defense funding, the DMR initiatives developed a clear picture of focused, efficiency and accountability.

The Report's major thrust is to act on problems, not restudy them. It stresses integrity, long-range planning, better communications DoD wide, strict accountability of managers for results, teamwork and innovation. The Report sets targets for management improvement, accompanied by **substantial dollar savings**. Secretary Cheney, February 1, 1990 [Ref. 22:p. 33]

Some of the major areas at issue in defense procurement studies have been: micromanagement by various agencies, acquisition personnel qualification and training, Congressional authority for multi-year appropriations, a multi-source often conflicting regulatory/statutory conundrum, and most visibly in the media, **cost overruns**.

In keeping with the premise of this study, the area of cost overruns is most susceptible when approached during the preliminary resolution of which performance characteristics

(requirements) are necessary in order to reduce the combat deficiency. Continuous "user generated" input could be employed not only to make an informed initial decision but keep the program manager updated with changing user performance requirements. In turn this input would assist in gauging the impact of cost/performance trade-offs as a weapon system proceeds through the DoD procurement process. A viable service acquisition process should include the capacity for this type of exchange between the program managers and the eventual operational "users" to assure consistent, current operational requirements.

Case in point-

The C-5A Galaxy cargo aircraft was a multibillion-dollar program that suffered from enormous cost overruns in the late 1960s and early 1970s. These cost problems were caused primarily by a combination of unrealistic and inflexible performance requirements.... The C-5A was required to meet a specified weight limit. It was also required to have the capability for austere (rough) field takeoff and landing.... The latter requirement forced a substantial redesign of the aircraft. No C-5A has yet used its austere landing capability.... As a result of the redesign, the plane exceeded the maximum weight limit. More redesign and the use of **expensive lightweight metals followed**. Had there been enough flexibility to relax either the maximum weight or the rough takeoff and landing requirements, the cost overrun would have been far less. [Ref. 1:p. 27]

In more general terms, the military has traditionally stressed performance over cost. Delivery schedule, unit cost, contract type, and cost - performance trade-offs have played a lesser role, particularly during preliminary conceptualization of weapon systems. Historically, the overarching result has been

a 40% to 100% cost overrun when considering entire DoD weapon systems programs (from start-up through retirement). [Ref. 18:pp. 169-178]

The program managers charged with guiding weapon systems through the acquisition cycle must have the flexibility and information to make trade-offs in requirements in order to meet the cost schedule and reduce charges of "gold-plating" or mismanagement. To improve the effectiveness of those charged with monitoring weapon systems through the acquisition cycle (primarily the program manager), the Packard Commission has provided several recommendations which have been accepted by the DoD and incorporated into newly published regulations. Two of the more important changes are: (1), the streamlining of acquisition organizations and procedures, which limits the reporting chain for program managers, fixes responsibility for cost/schedule/performance, and empowers them with more flexibility, and (2) stabilizing programs have been undertaken through the emphasis of cost and operational effectiveness analysis (COEA), the establishment of internal baselines for design and production costs, and consideration of multi-year procurement for high priority weapon systems. [Ref. 25:pp. 13-17 and Ref. 28:Parts 4, 5, and 11]

C. REGULATIONS

Thirty thousand (30,000) pages of regulations govern the DoD acquisition process. [Ref. 1:p. 20] Of these regulations

there are two primary documents which provide guidance and policy governing the acquisition of DoD weapon systems. They are DoD Directive 5000.1, Defense Acquisition, and DoD Instruction 5000.2, Defense Acquisition Management Policies and Procedures. Each of these has been revised as of 23 February 1991 and contains direction gleaned from many of the recurring recommendations by various studies and commissions. [Refs. 28 and 29]

Each of these leading initiatives addresses enhancement of the acquisition process, via more economical use of DoD funds, yielded by the streamlined process and stricter accountability. There must be supporting documentation from the initial mission need statement (MNS) through the completion of a detailed acquisition plan. At each milestone there must be an active decision by the designated milestone decision authority (MDA) to proceed to the next phase of the acquisition. The intent of the guidance is to translate the identification of an equipment based combat deficiency into a competent weapon system solution via an integrated management framework that links **requirements generation**, acquisition management, and the programming, planning and budgeting system. [Ref. 29:Part 1 and Part 2:pp. 2-1 to 2-5]

D. SUMMARY

In summary, many of the long sought changes within the DoD acquisition system will be pressed forward under revised, more practical policies necessitated given increased competition among the military services and reduced available funding. A Congress eager to pursue the domestic agenda, uncertain public support, and increased conflict within DoD for funding clearly point to the need for searching out a new paradigm to generate weapon systems requirements. In order to endure the "culling out" process, the need for particular weapon systems must evidence clear supportable logic upon which a solid constituency can be built. In the identification and development of combat deficiencies or mission needs, the information contained within a user generated data base could prove invaluable. Many of the questions posed in the preceding chapter could have been answered had a record been available which tied the specific performance requirement to the originally identified combat deficiency. Further, it is clearly indicated in the dialogue between the public, Congress and the Services that the most credible response to any challenge of a weapon systems necessity must be rooted in a clearly defined, well recorded "user" generated requirement. Given the span of years required to field a weapon system and its susceptibility to attack at any point in the process; every respondent (to Congress or the public) must be able to answer the pointed question: Why does your aircraft need to

land on an expeditionary runway or why does your helicopter need to fly that fast. These questions can only be answered consistently and credibly if the information developed during the determination of mission need is available within the "acquisition process." There has to exist a continuously updated body of knowledge based on real time, user generated, post exercise reports covering a broad subject range from personnel, to doctrine, to equipment. The degree to which this capability exists within the Marine Corps acquisition system will be examined as part of the detailed process review in the next chapter.

In answer to the first subsidiary question addressing the present acquisition environment and Congressional expectations: It can safely be deduced that weapon systems procurement will generally be viewed with skepticism and each requirement will undergo repeated challenges to its continuation at each step in the acquisition process. Whether or not a weapon system is ultimately fielded will be largely dependent upon the ability of the Services to continually, consistently and credibly tie the need for that weapon to an objectively defined combat deficiency against an ever changing enemy threat over a span of several years.

III. THE MARINE CORPS ACQUISITION PROCESS

The purpose of this chapter is to review the U.S. Marine Corps requirements development process as it relates to the identification of operational capability for newly developed weaponry and/or the enhancement of existing weaponry, and, to explore the contrast between the intent of governing directives and the realities of their implementation. Part-n-parcel of this review is an over-arching summary of the current acquisition process, how it is supposed to work, and the primary orders governing the process.

The term "requirements" can have multiple meanings even within the vernacular of DoD acquisition. In the macro view, requirements could mean the nuclear and conventional weapons amalgam necessary to implement a national strategy. In a micro focus, requirements could address the appended specifications for a single equipment item which contractually bind the manufacturer on how to build it. [Ref. 14: pp. 26-27] Additionally, there is an expansive body of information which considers requirements issues in a broad range between the macro and micro definitions. For the purposes of this chapter, "requirements" will be discussed as the term relates to the required operational capabilities (ROC) of the weapon systems assigned to a Marine Corps combat unit.

Specifically, this chapter briefly examines the pre-acquisition phase aspect of requirements determination by reviewing the Marine Corps process for identifying equipment related combat deficiencies. There are five phases in the DoD systems acquisition process. The first three phases: Concept Exploration / Definition; Concept Demonstration / Validation; and Full Scale Development are concerned with development of the weapons system and its attendant operational capabilities. The last two phases: Full Rate Production and Operations Support, are concerned with production and deployment. [Ref. 2:pp 2.3-2.9] Locus in quo for this discussion will be the second subsidiary question regarding the Marine Corps acquisition process and its incorporation of newly identified weapons system requirements into the process.

As the military enters an era of shrinking defense budgets, it is undeniable that performance requirements stipulated in the mission need statement must represent the most economical solution to the combat deficiency.

A great deal of the final cost is dictated by those initial statements of need: that is, matching the purpose of military forces with their possible employment in conditions of war, peace, and crisis; examining trade-offs among alternate military means; and, determining what affordable operational capabilities are required. From the requirements and planning process should come definitions of the basic operational capabilities and the attendant needs for the military systems, which can then be translated into specific acquisition programs. [Ref. 1:p. 26]

A. BACKGROUND

Coincident with his appointment as Commandant of the Marine Corps in July 1987, General Gray began a major reorganization of the Marine Corps acquisition structure. The seat of professional education and doctrinal development, housed in various units at Quantico, Virginia, was overhauled from "stem to stern." The system which resulted is driven by two major commands; the Marine Corps Combat Development Center (MCCDC), and the Marine Corps Research Development and Acquisition Command (MCRDAC). The framework for their integrated processes, discussed herein, is contained primarily in two orders - the Systems Acquisition Manual [Ref. 2] and the Marine Corps Program Initiation and Operational Requirement Documents Order [Ref. 3]. Interest in the topic of how programs begin and more importantly how the operational requirements are developed has been expressed at the highest levels for many years. Further, it is an area that is apparently perpetually ripe for improvement.

You seem to be saying, as I get it, that the men in the military who will actually be responsible for using the new weapons, the men in combat commands should be given more responsibility for setting the requirements for new weapons and testing them. Why are these functions now in the hands of developers rather than the men who will use them? [Ref. 4:p. 123]

These are the questions of the Honorable John Stennis, then Chairman of the Senate Committee on the Armed Services, posed to Dr. Jacob Stockfish in response to testimony before the Committee. The date was 1971, and Dr. Stockfish was

discussing the operational requirements of a new helicopter. Dr. Stockfish had just responded that he had no idea why a proposed helicopter had to fly at a certain speed. He intimated that the developers had sold the requirement to the Army and it was not a valid tactical requirement. Two decades later, the concern about "real" rational system performance requirements continues. A GAO report published in May 1990 provides a sense of our opportunity lost in terms of efficient procurement;

In many cases, reducing performance requirements by 5 to 10 percent could probably reduce the cost of weapons systems by 30 to 50 percent, permitting the procurement of much larger numbers of only slightly less capable weapons. [Ref. 21:p. 39]

The war in the Persian Gulf has resulted in headlines and Congressional concern as to "why" close air support pilots attacked "friendly" forces repeatedly. Furthermore, how did we procure a multi-million dollar global positioning system that did not work effectively on the smoke covered battlefields of Kuwait even though reduced visibility is a well known and planned for aspect of the modern battlefield? [Ref. 6] These examples underscore the conspicuous necessity for the development and use of the most efficient requirements determination process that can be generated. If we are going to endure a complex, politically charged acquisition process, which requires ten to fifteen years to complete, then **the resulting hardware must be able to perform**. To this end, the new DoD 5000 series instructions prescribe many common-sense

methodologies which must be implemented by each of the military services. Among these is the mandate that performance requirements be used in describing weapons systems in requests for proposed solutions. By opting for performance based operational capabilities vice concentrating on meeting military specifications, design specifications, contractor "sold" emergent technology, or other potential distractions the new process contains the flexibility to field a weapons system that works as intended on the battlefield, as it exists in reality, when the weapon is finally delivered. This one change to the process holds the potential for substantial economic gains in executing trade-offs among alternate concepts and systems. This idea (along with the "streamlining" nature of the DoD series) has been embraced by the Marine Corps and is included in the draft orders which will implement the DoD instructions. The balance of this chapter will discuss the Marine Corps acquisition process as contained in the draft documents and will include emphasis on requirements generation at the commencement of the Marine Corps acquisition process.

B. STRUCTURE

The acquisition stream depicted in both Marine Corps Orders P5000.10c and 3900.4d, are essentially the same as that portrayed in Dr. Sherman's text, Government Procurement Management. Milestones are used at prescribed decision points

to gauge progress of the system from initiation to system review. Curiously enough, the progress from milestone 0 (program initiation) through milestone V (system review) is well structured trackable and managed in detail. The "fuzzy" portion of the process is the same as that referred to by Dr. Stockfish in 1971. Is there a clear and concise answer to the questions? How did it get started? And, why do these specific operational requirements exist? The pages of Marine Corps Order 3900.4d provide both skeletal and specific direction in answer to the "how" of the program initiation process. In capsule form, the major drivers and concepts of the requirements generation and subsequent program initiation process will be reviewed.

1. Concept Based Requirements System

The Marine Corps acquisition process is set in motion via the methodology of a Concepts-Based Requirements System (CBRS). [Ref. 3:pp. 3-6] The purpose of CBRS is to provide capability that is driven by operational needs. The intent is to provide for a flexible process which is adaptable to both short and long range scenarios. CBRS is intended to allow the Marine Corps to identify combat capability needs, expose capability shortfalls, and bounce those findings against potential resolution alternatives in order to close the gaps.

The CBRS methodology is utilized to examine combat capability requirements regardless of how the "gap" is initially identified. Identification of Marine Corps combat needs is intended

to be a "Corps-wide" pursuit. Fleet Marine Forces are the operational commands and generally look to near-term issues. MCCDC and MCRDAC are support commands and are formally required to examine short-mid-long range issues. The throughput of CBRS should be a refined concept which can be evaluated by testing, modelling or other means, in order to determine whether modification to existing equipment is satisfactory or if new equipment needs to be acquired. Again, CBRS is an idea or method in which the focus is on need driven resolution of a combat deficiency.

2. Mission Areas (MA)

The integrated missions of the Marine Corps have been subdivided into similar or related groupings and assigned as a Mission Area (MA). For example, MA #20 is ground combat and MA #24 is ground combat fire support. Responsibility for all warfighting MA's is assigned to the Commanding General (CG), MCCDC as the Marine Air Ground Task Force (MAGTF) proponent. The CG, MCCDC, tasks the Director (BGen) of the MAGTF Warfighting Center (MAGTF-WC) with the primary role in combat development, analysis and initiation of the acquisition process. Determination of mission need, the sketchy part of the acquisition process preceding Program Initiation (milestone 0), is filled in at the MAGTF-WC. This early part of the process is much less well defined than post Milestone 0 activities. [Ref. 2:pp. 3-21] As directed by the CG, MCCDC, the Director of the MAGTF-WC is the keeper of the

"duty experts and analysts" and is responsible for the entire spectrum of Marine Corps Force capabilities. The Director is the proponent for monitoring operational capabilities, identifying deficiencies and developing concepts for employment of the systems produced to sustain necessary combat capabilities. The vehicle used to set the process in motion is the Mission Area Analysis (MAA). The MAA is the primary means of identifying deficiencies which are then linked to plans that will reduce the deficiencies. [Ref. 3: p. 6] The outcome of a MAA should provide clear direction concerning the operational needs, shortfalls, candidate solutions, and priorities. [Ref. 2: pp. 3-21] The MAA recommendations will be incorporated into one of four areas: doctrinal development, force structure realignment, training adjustments, or research and development. Once a material deficiency has been identified and validated by a MAA, the CG, MCCDC, establishes the priorities of applicable operational requirements and presents them for consideration during the Program Objective Memorandum (POM) preparation at Headquarters Marine Corps (HQMC).

3. Strategic Plans

The Marine Corps Campaign Plan (MCCP) outlines the Commandant's guidance and prescribes the Marine Corps contribution to the national defense. It contains an appraisal of the probable missions the Corps may perform, including expectations and limitations. Specific direction is promulgated to the Fleet Marine Force (FMF) Commanders

(Lieutenant General) concerning objectives to be attained within a set time frame. Similar direction is provided to the major supporting agencies. The overreaching intent is to make certain that the Commandant's vision of the current and future capabilities of the Marine Corps is reflected. This plan is the springboard from which the MA specialists take their perspective for gauging what the Marine Corps' combat capabilities need to be. [Ref. 3:p. 5 and Ref. 2:pp. 3-25]

"The MAGTF Master Plan (MMP) establishes the operational foundation for the organization, manning, equipping, training, and development of doctrine and operational techniques for MAGTF's." [Ref. 3:p. 6] The focus is mid-range, from one to ten years out. Direction is provided regarding resource allocation for the same four areas as referred to in the CBRS: organization, training, equipment and doctrine. The most critical purpose of the MMP is to announce guidance for the drafting of several detailed supporting annexes: the MAGTF command annex, the MAGTF Ground Combat Annex, the MAGTF Aviation Combat Annex, and the MAGTF Combat Service Support Annex. These annexes catalog the detailed actions which need to be taken in the four areas (organization, training, equipping, and doctrinal development) to ensure that Marine Corps combat capability will meet or exceed potential threat capability. The MMP allows for the consideration and programming of developmental initiatives as needs are uncovered. These initiatives are then prioritized and compete

for funding in the POM process. The MMP is published every other year based upon guidance from the Commandant. The Marine Corps Long Range Plan (MLRP) aggregates concepts and goals considered fundamental to accomplishing combat missions in the future. It also is developed by the CG, MCCDC staff at the MAGTF-WC and, as the name implies takes the perspective of ten to twenty years in the future. The MLRP presents potential developing technologies juxtaposed with potential threat capabilities.

4. Documents

As with any large organization, essential permanent communication is accomplished in writing. Currently, each of the orders which implement the entire acquisition process are under review to ensure compliance with the DoD 5000 series. Three of the more descriptive documents which will remain in the system (albeit possibly renamed) are: the mission need statement (MNS)/initial statement of requirement (ISOR), the development options paper (DOP)—{now the operational requirements document}, and the required operational capability (ROC). [Ref. 3:pp. 5-9] Once a Mission Area Analysis has identified that the deficiency must be filled through the material acquisition process, this need is documented in a mission need statement (MNS) or initial statement of requirement (ISOR). These serve as the basis for initiating a program. The specific hardware solutions are not included herein, but are developed in the concept exploration phase

prior to milestone I. A MNS is necessary for all new starts where outlays exceed \$300 million for research and development or \$1.8 billion for the total procurement of all Acquisition Category (ACAT) I systems. An ISOR is required for all programs considered less than major: ACAT II, III, and IV systems.

After completion of the MNS/ISOR, responsibility for preparation of the development options paper (DOP) shifts to the Commanding General, MCRDAC. The DOP will for the first time outline all feasible alternatives which provide the performance range necessary to reduce the deficiency. Cost is not yet an overt consideration. The CG, MCRDAC via his Directors of Tests & Evaluation and Amphibious Warfare Technology, will conduct concept evaluations as necessary. The DOP will help guide in choosing among those alternatives available which can best be developed into a viable ROC. The required operational capability (ROC) is the driving document used in the acquisition process from milestone 0 forward. It should describe the required capability not just a single system. One or more potential solutions may be discussed. It includes a statement of the need, a threat description, operational and organizational concepts, and **the essential performance characteristics.**

C. PROCESS AND STAFF INTEGRATION

As can be drawn from the preceding dialogue, the requirements generation and program initiation process, is intended to be a highly structured, integrated, **need driven** system which objectively seeks out not only combat deficiencies but initiates the process to overcome them.

The balance of this chapter discusses the specific assignment of responsibilities to and the interaction among cognizant staffs located at both Headquarters Marine Corps and Quantico.

1. Form

The Marine Corps acquisition team consists of several staffs housed at Headquarters Marine Corps, Washington, D.C. (HQMC); MCCDC/ MCRDAC, Quantico, Virginia; and the Fleet Marine Forces Atlantic and Pacific. The members of this team have been condensed, for this discussion, to include: the Commandant of the Marine Corps (CMC); the Deputy Chief of Staff for Requirements and Programs (DC/S R&P); the Commanding General, Marine Corps Research, Development, and Acquisition Command (CG MCRDAC); the Commanding General, Marine Corps Combat Development Command (CG MCCDC); and the Commanding Generals, Fleet Marine Forces Atlantic and Pacific (CG FMF PAC/LANT). [Ref. 3:pp. 3-7]

a. As stated earlier, CMC breathes life into the acquisition system via the Marine Corps Campaign Plan (MCCP), specifically:

the MCCP frames the Commandant's intent and forms the basis for the architecture of the future warfighting capabilities of the Marine Corps. It guides what has to be accomplished and tells why it needs to be done. The MCCP also serves to provide direction to appropriate supporting establishments to ensure that action is taken on all relevant issues which reflect the Commandant's intent and the vision of the future Marine Corps. The plan provides the platform to capture innovative concepts, and to institutionalize Marine Corps planning processes, CMC policies, and needed program initiatives. [Ref. 4:p. 5]

Additionally, CMC has the obvious overall responsibility for the capability of the Marine Corps to perform its assigned specified missions and any other tasks which the President may direct.

b. DC/S R&P has the responsibility to ensure that funding is correctly reflected in the Program Objective Memorandum (POM) and serves as an "honest broker" in the Planning, Programming and Budgeting Process (PPBS) to assist CMC in the prioritization and funding of programs. DC/S R&P is specifically tasked to:

review, monitor and validate Marine Corps capability requirements as they progress from general statements of required operational capability (ROC) in planning documents through successively refined statements in acquisition and programming documents to ascertain program consistency, completeness and harmony. [Ref. 3:pp. 3-8]

As part of the literal translation of these responsibilities, DC/S R&P articulates unresolved programming issues, provides official comments on documents and ensures the HQMC staff analyzes requirements validation and program development.

[Ref. 3:pp. 3-9]

c. The CG MCRDAC has broad oversight responsibility for the complete acquisition process from development of systems/equipment to their production and modification. He is the designated Marine Corps Program Executive Officer (PEO), and is the approval authority for Master Acquisition Plans (MAPS). [Ref. 3:pp. 3-13] Three of his primary supporting agents are: his Deputy for Programs/Deputy Commanding General, the Director of Amphibious Warfare Technology, and all Program Managers. The Deputy for Programs is tasked with overall organizational management for all aspects of MCRDAC's operation. Some of his specific responsibilities are to coordinate programmatic actions with the CG MCCDC, and to maintain close liaison with their Warfighting Center. [Ref. 3:pp. 3-18]

The Director of Amphibious Warfare Technology is the primary advisor to the CG MCRDAC on all matters related to research and technology. He is specifically tasked to identify emerging technology and to assess new technological development in terms of its potential application for increasing combat capability. [Ref. 3:pp. 3-20] Program Managers are the action arm of the acquisition business as designated by the CG MCRDAC. They work directly for the CG under his PEO hat and have full authority for management of their specified acquisition projects.

PMs develop plans, program and budget for funds, and manage assigned programs as assigned by the PEO and other appropriate higher authority. PMs are assigned during the

requirements determination process. PMs are assisted in the acquisition process by a matrix management organization which provides functional support under the direction of the Deputy for Support, MCRDAC. They manage assigned programs from inception through milestone IV (Logistics Review) with respect to cost, schedule, performance and supportability. [Ref. 3:pp. 3-16]

d. The CGs of FMF PAC/LANT are charged to work in concert with GCMCCDC to identify, review, and validate operational requirements and to support operational testing of new equipment and systems. [Ref. 3:pp. 3-23] The minimal involvement of user units in the initiation and development of new equipment may well be an area where the process can be demonstrably improved. This potential is discussed in the next section entitled "How the Process Works."

e. The CG MCCDC is the primary agent for the Marine Corps in the development of Marine Air-Ground Task Force (MAGTF) required operational capabilities (ROC). The critical role, within MCCDC, is played by members of the MAGTF Warfighting Center. The Marines assigned here work through a process termed the Concept Based Requirements System (CBRS) to identify combat capability deficiencies and initiate the acquisition process. The role of the MAGTF Warfighting Center illuminates the majority of the issues in question. Most of the process involving program initiation and the development of initial required operational capabilities is begun in the MAGTF Warfighting Center. [Ref. 3:pp. 3-21] "Proponency" for the Marine Corps combat capability and the development of required operational capabilities rests here. Requirements

for changes to doctrine, force structure and equipment are identified by the Mission Area Analysis section (MAA) and a solution to the combat deficiency is set in motion. The Center is tasked with the development of the Marine Corps Long Range Plan (MLRP) and the Marine Corps MAGTF Master Plan which prioritizes mid-range objectives. By serving as the proponent for Fleet Marine Force POM initiatives in the PPBS process, the Center influences and prioritizes short range objectives. As can be seen from these excerpts of their responsibilities, the Center has (according to structure) a pervasive role in the initiation of equipment development and acquisition.

2. Function

The intended functioning of the start up process is delineated in sections of MCO 3900.4D and is outlined in this paragraph. [Ref. 4:pp. 3-15] A new program initiation is the result of an outflow from the concepts based requirements system (CBRS). It is here that the second subsidiary question, relating to the identification of weapon systems requirements can be addressed in more depth. This methodology starts with the Marine Corps Campaign Plan (MCCP) as a framework. Combat capability is then analyzed against current and future Marine Corps missions and doctrine. The vehicle used to identify deficiencies is the Mission Area Analysis (MAA). These are conducted within the MAGTF Warfighting Center at MCCDC. The Mission Areas MAs are broken into related broad areas such as "ground combat" and "combat

service support." The MAA will bounce operational concept against probable threat scenario. Gaming, simulation and field exercises will be used to refine deficiencies and these results will serve as the foundation for future operational parameters. Once an MAA identifies a significant deficiency, a decision will be made to address the shortfall by means of personnel, doctrine, equipment modifications, or new equipment acquisitions. If the decision is made to close the capability gap with new equipment, the requirement will be articulated in one of several document formats. The Mission Need Statement (MNS), the Initial Statement of Requirement (ISOR), the Preliminary Training Device Requirement (PTDR), and the Requirements Submission (RS) are each utilized as required to communicate the validated need. The CG MCRDAC will review the draft program initiation document and produce an affordable cost estimate (ACE). The ACE will be attached to the program initiation document for further staffing. Ultimately, the approval of this initiating document at the appropriate Acquisition Category Level (ACAT) will constitute program initiation. The acquisition program will then be included to compete for funding in the MCCDC evaluation process and then in POM action at Headquarters Marine Corps. The program will be assigned a priority and then placed in either the MAGTF Master Plan (MMP) or the Marine Corps Long Range Plan (MLRP). The priority ranking is a critically important issue from a practical point of view. The MMP includes projects from one

to ten years out and the MLRP contains future projects up to twenty years down-range. The loiter time of these projects from one to twenty years and the ability of the program to be managed in an effective manner by successive officers may be one of the primary areas which needs to be improved. After the publication of the MNS, ISOR, PTDR, or RS, the CG MCCDC will request that CG MCRDAC prepare a Development Options Paper (DOP). This document is required for all ACAT I, II, III, and IV programs unless waived by the Assistant Commandant of the Marine Corps (ACMC). Its purpose is to lay out all potential acquisition alternatives from the low grade modification of existing equipment to the development of advanced technological systems. CG MCRDAC may elect to conduct further concept testing in order to evaluate different proposals against "capability, feasibility, and affordability." The period allowed for the development of the DOP will not exceed four months. A Life Cycle Cost Estimate (LCCE) will be completed in accordance with an approved MCRDAC costing method, which is standardized to allow for cross comparison against other programs. The DOP with the LCCE attached will be used to frame essential information used to construct the Required Operational Capability (ROC) statement. The ROC is the root document to support the Acquisition process. It will describe the specific equipment/material capabilities necessary to fill the prescribed deficiency identified by the initiating document. When the ROC is

approved it will be used as a foundation for added exploration or development of more alternatives. In other words the ROC will be used as the basis for the decision on whether to enter the concept demonstration phase of development. The ROC will not provide a narrow description of equipment but rather the whole range of capabilities required to close the deficiency gap. It may even identify more than one feasible approach to fill the gap.

The ROC includes a statement of need, a description of the threat, the operational deficiency to be overcome, the operational and organizational concepts, the essential performance and suitability characteristics together with any preplanned product improvements (P3I), the life cycle cost estimate and any other important considerations.
[Ref. 3:pp. 8-9]

The ROC may be amended during the development process but the basic deficiency need will not be altered unless the threat changes. It is interesting to note that the only formal access to the initiation process by the users in the Fleet Marine Forces is via the FMF/Supporting Establishment Operational Need Statement (FONS). It is specifically noted that it is not a requirements document but a channel for the user to state an operational need or deficiency. The CG MCCDC reviews the FONS and if the requirement is validated, appropriate documents are prepared and the need will be folded into the CG MCCDC process.

Almost all initiating documents are staffed in rough draft form by CG MCCDC to a broad audience. After appropriate comment and discussion among the various staffs, a smooth

document is prepared and forwarded to ACMC for approval. If approved, the MNS is forwarded to Secretary of the Navy (SecNav) for the Naval Acquisition Executive (NAE) and then the Defense Acquisition Executive (DAE) for approval prior to publication by the CG MCCDC. This completes the review of the functional process of acquisition initiation.

3. "How" The Process Works

The part of the process which includes program initiation would indicate that analysts housed at the MAGTF Warfighting Center, working in concert with DC/S R&P, would be continuously scrubbing our present combat capability and comparing it with assigned Marine Corps missions. Once a significant deficiency was detected the system would suggest steps to close the capability gap. When the answer identified required a new item of equipment then the acquisition system would be put in harness and ultimately the item would be added to the inventory. The directives also portray a thorough staffing of requirements development documents among MCDRAC, MCCDC and the Fleet Marine Forces in which each agency makes comments and recommendations to ensure that the completed ROC has undergone a rigorous brainstorming process and describes the "best" answer to the deficiency in performance terms. To be sure, a quick read of the process would not highlight a systemic problem regarding the issues in question. There are however, some underlying obstacles. According to the source indicated by LtCol Lesnowicz [Ref. 15]:

a. The Mission Area Analysts are inundated with near term projects geared to answering Table of Organization (T/O) and Table of Equipment (T/E) problems. There is no ongoing comprehensive audit to cross compare mission and capability. The equipment issues which are worked consist of those which were previously identified or those which become "a gleam in the proponent's eye." This critical part of the process breaks down under the weight of day to day activity. Acquisition initiation is more driven by: obvious technology breakthrough, separate service "piggy-back," or senior officer interest. In spite of the nebulous process, the Marine Corps remains ably equipped. The supposition is that service-shared projects and the genuine wisdom of our senior officers absorb the slack from lack of adherence to the stated process when it comes to identification of new equipment.

b. There is system access for the "users" in the Fleet Marine Forces via the FONS, and by comment throughout the staffing of proposed (ROC) statements. Additionally, there are informal opportunities for input from both the operational side and the developmental side. It would seem that sufficient access exists to allow for adequate exchanges of information to take place to accomplish a "best" capability description/modification. Here the issue becomes a case of intercommand communication gaps. The problem for the Fleet Marine Force is one of "out of sight, out of mind." They are completely engrossed in the functioning of an expansive

command, and no one is assigned, tasked, or responsible for fulfilling the input requirements. Human nature runs its course and low priority is assigned to these types of queries from the "acquisition system" side. This same situation also becomes the bottle-neck for input attempts by the "user." From a different angle, it becomes too tedious to get the General to sign off on the input when there is no staff member tasked with the responsibility. Thus the input is permanently tabled, or so filtered it does not resemble the original proposal.

From this perspective, the functional design of the acquisition process may not match up to the "how" it really works aspect of the process. For the purposes of this review; any such disconnect can only serve to undermine the integrity of the process and will inevitably lead to the erosion of credibility in light of the demanding Congressional / public environment described in Chapter II. To take advantage of the heightened credibility afforded "user-based" operational requirements; the FONS and MCLLS generated remedial action input should be energized. And once recorded, "user-based" input must be continually updated and provided to the program manager at each step in the acquisition process.

D. SUMMARY

The answer to the second subsidiary question; regarding incorporation of newly identified weapon systems requirements

is neatly identified from a regulatory perspective by the preceding review of the Marine Corps acquisition process structure. What emerges is an elaborate and complex process that seeks integration across command lines and allows for continuous improvement of the weapon systems required operational capabilities while maintaining linkage to the operating forces. Thus ensuring that the resulting weapon system can perform adequately to reduce the targeted gap in combat capability when it is delivered to the field. However, this offers an incomplete answer without comparison as to how the process works in day-to-day operation. The "how" as to process, reveals some potential practical limitations and points out the existence of gaps between the process as written and the process as performed. On the one hand, we have a large superstructure designed to coincide with the recommendations and direction provided by the DoD. On the other hand, there is minimal structure "below the waterline," to integrate the pivotal role played by a handful of Mission Area Analysts and no systemic solution to ensure that information relating to the original development of the required operational capability is continuously updated and available to the program manager.

On balance, the Marine Corps acquisition process as executed by well intended officers has somehow managed to equip Marine units with the capacity to perform their assigned combat missions. Over a period of several years, the Marine

Corps has developed and fielded weapon systems which have allowed for maintaining capability over a wide range of combat roles and missions. However, historical accomplishment alone will not assure future success in weapon systems procurement. Given the unprecedented DoD "drawdown," a demanding Congress / public, and ever increasing technical complexity of the weapon systems being procured, the challenges to the integrity of the Marine Corps acquisition process will be significant. An important gauge as to the efficiency, of the current process, and the durability of the weapon systems operational performance requirements generated by that process will be: how well the process as written matches up to the process as practiced.

IV. SUMMARY / RECOMMENDATIONS / CONCLUSIONS

A. SUMMARY

In answer to the third subsidiary question, as to the potential for better matching Congressional / public expectations by formally recording "user-based" weapon system performance requirements via the Remedial Action Program; the answer is clearly affirmative. Chapter II demonstrated the need for a resilient required operational capability that will withstand the test of time in a demanding oversight environment. Through the use of examples from literature and Congressional testimony it was shown that the most durable required operational capabilities are those which have been "user-based" and reflect a combat deficiency which can be recounted over a span of time. Chapter III reviewed a complex Marine Corps acquisition process and noted that while the process was vigorous "on paper" there were some important disconnects "in practice" which could lead to a loss of information over time and/or a distancing of the acquisition process from the user. It is clear from this research that the more effective the integration of the acquisition process with the operational, "user" input, process, the better we will be able to match Congressional / public expectations in a demanding environment. Taken in overview, there are several

notions/ problems discussed previously which lend themselves to obvious recommendations. There are also certain thoughts gained from reviewing the research material which are resident in the issues discussed if not specifically detailed.

B. RECOMMENDATIONS

1. Responsibility

One of the underlying difficulties in the Marine Corps acquisition system is highlighted by both Dr. Stockfish [Ref. 17:p. 131] and Dr. Massey, [Ref. 14:p. 20] relating to DoD as a whole. That is the problem of responsibility. During the process of initiation there is minimal fixing of responsibility in the Marine Corps system. As the process gets under steam, a Program Manager is assigned, but this is too late. At that point, basic decisions and more importantly basic assumptions have already been made. These are not recorded and may have been made by one officer acting alone. The experts seem to suggest that the paper trail is filled with a large quantity of information rather than the necessary quality of information throughout an acquisition program. It also appears that the inability to reconstruct the baseline assumptions present during the initial transition from operational deficiency to performance parameters is critical to preventing future decisions from being delayed or misguided, because the program managers cannot accurately

replicate the perspective of the "users" who originally identified the need for the weapon system.

For example: absent the basic assumptions which led to a decision on a certain tank main gun cannon size, a downrange decision could easily bungle the rationale into mistaking the need for a new gun into the need for a new tank that does not necessarily close the combat capability gap. Assume that an operational deficiency exists in that our tank round cannot penetrate the threat tank unless it can pass through 100mm of armor plate. During our initial development, we determined that given the current state of the art for armor and ammunition, we must have a 120mm main gun. Following this, we discover that a new tank will be required to handle the larger gun. The acquisition system is set in motion to obtain the new tank with the new gun. At a later date, but prior to full scale production, any one of several events could occur which could lead down the wrong road. A development in ammunition technology could obviate the need for a 120mm cannon and accordingly the new system. A development in armor protection makes it impossible for any round smaller than a 150mm cannon to obtain the desired destructive capability, again removing the need for the new tank. A changing global situation results in a mission realignment which removes the threat theater that required the new gun. Of equal significance, competition for funding could force system capability trade-offs, wherein the critical

performance capability is lost in the "noise level" of getting a new tank. Any one of dozens of downrange events could mandate a review of the acquisition. If the baseline assumptions are not available the entire process must be completed from square one. The resources wasted in reinventing the decision process must inevitably result in a drawing out of the acquisition in terms of both time and money. More critically, a significant misstep could place Marines in combat without the combat capability the mission demands. Remember, in the brief example, there was never a need for a new tank. The combat capability required was to penetrate armor not buy a tank.

The recommendation of this thesis is that the Program Manager be assigned prior to development of the ROC, and that **the assumptions which condition initial decisions about performance parameters be reduced to writing and made a permanent part of the systems history.** Under the old acquisition system, pre-1987, much of this work was done by the Acquisition Coordination Council (ACC). [Ref. 28] Under this structure, interaction between MCRDAC and MCCDC was detailed and frequent. A similar arrangement, expanded to include the FMF, should be initiated. This would fix responsibility at the program manager billet and allow for an available record to be reviewed as needed.

2. Communication

The question here is how do we give the issue of input to ROC decisions enough visibility to provide for continuous and credible cross-talk among MCDRAC, MCCDC and the FMF. In an environment where each of the players in the process are not structurally forced to integrate, the exchange will not take place on a routine basis. There are too many competing issues. Yet, a need for this discussion is stipulated in virtually all of the research material. Additionally, the current state of the Marine Corps acquisition system does not completely fill the void. The system allows for "user" input but it is an extracurricular event. The recommendation of this thesis is to attach the responsibility for input to a principle staff officer in the FMF headquarters. For example, the Assistant Chief of Staff G-5, Plans officer, could be tasked with this responsibility in conjunction with his traditional role of developing strategic plans. [Ref. 6] Also, each of the Commanding Generals would have to introduce sufficient interest in the process to create an environment where a meaningful dialogue is the routine not a frustrating exception. It should be noted that this type of discussion is not foreign to the officers in the "user" forces. The analysis of capability takes place with every deployment and every exercise. Further this information is already required in large measure by the submission of lessons learned via the MCLLS. The only added work that is involved is attaching the

information to the appropriate program and interacting with the MCDRAC - MCCDC staffs. Here too, the vehicle already exists in the form of the Remedial Action Program. Via RAP the acquisition system, housed in Quantico, can readily interact with cognizant FMF staff officers, located around the world, to continually update required operational performance capabilities and assess the impact of cost benefit trade-off decisions by the program managers, before they are made.

C. CONCLUSION AND RECOMMENDATION FOR FURTHER STUDY

The lack of "user" input and/or the incomplete development of required operational capability has been a longstanding issue within DOD. Personal observation, recognized experts in the field and authors have all defined the problem over the last forty-plus years. In his book, The Defense Game, Mr. Richard Stubbing, relates yet another story of the system (Army) shooting itself in the foot over the capability required of a critical item of equipment, a remotely piloted vehicle. This was a "tail wagging the dog" scenario where unnecessary requirements drove the program vice the actual combat deficiency. [Ref. 13:pp. 146-149]

The existence of the problem is not a contentious issue. The wholesale redirection of attitudes and thought processes within the acquisition system, however, is a complex and richly quarrelsome issue. The overreaching solution is well beyond the scope of this thesis, but the Marine Corps "system

fix" is largely in place and has been published at least in a draft version. [Ref. 3] With a small change to staff responsibility at the FMF Headquarters and interest at the general officer level many of the questions at issue would be quickly resolved.

Three areas in which further study could provide benefit are:

1. A detailed examination of the Marine Corps Lessons Learned System and its integration with the Remedial Action Program.
2. An examination of selected weapon systems procurement histories to objectively identify where the process record does not match up to process expectation.
3. An analysis as to how the Total Quality Leadership concept is utilized to continuously improve the Marine Corps acquisition process.

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